

## **REMARKS/ARGUMENTS**

The Examiner is thanked for the courteous telephone interview granted Applicant's representative on November 13, 2009. During the interview, proposed amendments to claim 1 were discussed. The Examiner indicated that the proposed amendments appeared to distinguish over the cited art, and requested that this Response clarify the mechanism that causes the ply and the backing of the backed ply material to diverge during a cutting operation.

Claims 1-3, 6-9, and 25 are pending in the present application. Claim 1 was amended, and new dependent claim 25 was added. No claims were canceled. Support for the claim amendments and the new claim can be found in the specification, for example, in paragraphs [0034], [0035], and [0043]. Reconsideration of the claims is respectfully requested in view of the above amendments and the following comments.

### **I. 35 U.S.C. § 103, Obviousness**

The Examiner has rejected claims 1, 7, and 8 under 35 U.S.C. § 103 as being unpatentable over Bell et al., U.S. Patent No. 5,265,508 (hereinafter "Bell"), in view of Gharst et al., U.S. Patent No. 6,813,985 (hereinafter "Gharst"), and Jung, U.S. Patent No. 6,152,003 (hereinafter "Jung") and in further view of Hreha, U.S. Patent No. 4,077,290 (hereinafter "Hreha"). This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

Bell discloses a system comprising: an anvil (T-shaped member, 72; Figure 9-10) and a ultrasonic blade (ultrasonic cutting tool, 4), the anvil for providing support to a backed ply material during a cutting operation by the ultrasonic blade (4), the back ply material comprising a ply material and a backing (the material is not being positively claimed) traveling in a first direction (towards the blade), the ultrasonic blade having a cutting profile (blade 46), the ultrasonic blade being operable to travel along a cutting path (along channel 73) the cutting path being orientated in a transverse manner relative to the first direction, the anvil comprising: a rigid base (bottom of T- shaped member) for securing the anvil to a cutting assembly; an inverted channel (channel 73) in the rigid base and coinciding with the cutting path; an insert (Lexan plastic strip 74) to mate with the channel; a surface (top of insert) on the insert to support the backed ply material, the surface being secured to the base (72).

Bell does not disclose a groove disposed upon the surface and coinciding with the cutting path that is formed in the insert prior to any cutting operation by the ultrasonic blade, and having a curved profile corresponding to a tip portion (46) of the cutting profile, the groove providing support during the cutting operation, wherein a backing of the backed ply material is urged into the groove during the cutting operation.

However, attention is directed to both the Gharst and Jung references which both disclose cutting operations for cutting partially through a material. Jung discloses the use of both a cutting wheel and an ultrasonic cutting tool that can both be used to cut to a specified depth relative to the material to be cut and also the plastic supporting surface, which is utilized to protect the anvil and blade from contacting. Alternatively, Gharst discloses a cutting wheel to cut through a two ply material, where the blade severs the top layer, yet leaves the backing layer unscathed. Gharst discloses this means is accomplished by utilizing a slitting groove positioned underneath the cutting wheel, which additionally provides for a cleaner cut without damaging the cutting wheel or the anvil by incidental cutting contact. Although Gharst does not disclose that the slitting groove is usable with an ultrasonic cutting tool, as shown by Jung that the two types of cutting tools, cutting wheels, and ultrasonic cutters, are both usable to cut a specified depth into a material, it would have been obvious to one having ordinary skill in the art to have similarly tried utilizing a groove positioned in the anvil of Bell to effect either a partial cut or to protect the Bell ultrasonic cutting blade from contact with the anvil as taught by Gharst and Jung. The modified device of Bell still does not disclose that the channel (73) is an inverted "T" shape, nor that the insert is also "T" shaped. However, attention is directed to Hreha that discloses another insert possessing an inverted T-shape that mates with a corresponding inverted -T shaped channel. Hreha discloses that providing inserts of a variety of shapes (see at least Figure 2 and 7) is well known in the art as they allow the insert to be removably secured within the channel. T-shaped inserts unlike rectangular inserts hinder the movement of the insert in the forward direction. It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the inserts of Bell to comprise a T-shape as taught by Hera as T-shaped inserts are old and well known in the art for improvements in more secure, yet detachable connections.

In regards to claim 7, the modified device of Bell discloses wherein the insert (74) comprises a polymeric material (Lexan plastic).

In regards to claim 8, the modified device of Bell discloses wherein the polymeric material comprises an ultra high molecular weight polymer (Lexan plastic is a high molecular weight polymer).

Office Action dated October 16, 2009, pages 3-5.

Claim 1, as amended herein, is as follows:

1. A system having an anvil and an ultrasonic blade, the anvil for providing support to a backed ply material during a cutting operation by the ultrasonic blade, the backed ply material traveling in a first direction and comprising a ply and a backing, the backing being relatively more flexible than the ply, the ultrasonic blade having a cutting profile, the ultrasonic blade being operable to travel along a cutting path, the cutting path being oriented in a transverse manner relative to the first direction, the anvil comprising:

- a rigid base for securing the anvil to a cutting assembly;

- an inverted "T" shaped channel in the rigid base and coinciding with the cutting path;

- a "T" shaped insert that mates with the channel;

- a surface on the insert to support the backed ply material; and

- a groove disposed upon the surface and coinciding with the cutting path, the groove being formed in the insert prior to any cutting operation by the ultrasonic blade and having a curved profile corresponding to a tip portion of the cutting profile of the ultrasonic blade, the groove providing support for the backing of the backed ply material during the cutting operation such that the ply and the relatively more flexible backing of the backed ply material diverge at an interface between the groove and the tip portion of the cutting profile of the ultrasonic blade, and the backing is urged into the groove during the cutting operation, the ultrasonic blade cutting the ply without cutting the backing during the cutting operation.

The Examiner bears the burden of establishing a *prima facie* case of obviousness based on prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). The prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In determining obviousness, the scope and content of the prior art are... determined; differences between the prior art and the claims at issue are... ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or non-obviousness of the subject matter is determined. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). "Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l. Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007). "*Rejections on obviousness grounds cannot be sustained by mere conclusory statements;*

*instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. Id. (citing In re Kahn, 441 F.3d 977, 988 (CA Fed. 2006)).”*

In the present case, the Office Action does not establish a *prima facie* case of obviousness in rejecting the claims because neither Bell nor Gharst nor Jung nor Hreha nor their combination teaches or suggests all the claim limitations. With respect to claim 1, for example, neither Bell nor Gharst nor Jung nor Hreha nor their combination teaches or suggests at least “a groove disposed upon the surface and coinciding with the cutting path, the groove being formed in the insert prior to any cutting operation by the ultrasonic blade and having a curved profile corresponding to a tip portion of the cutting profile of the ultrasonic blade, the groove providing support for the backing of the backed ply material during the cutting operation such that the ply and the relatively more flexible backing of the backed ply material diverge at an interface between the groove and the tip portion of the cutting profile of the ultrasonic blade, and the backing is urged into the groove during the cutting operation, the ultrasonic blade cutting the ply without cutting the backing during the cutting operation.”

Bell is directed to an ultrasonic cutting system for cutting a stock material. The cutting system includes an anvil for supporting the stock material and an ultrasonic cutting tool for cutting the stock material. As shown in Fig. 1 of Bell, during a cutting operation, the stock material is moved in a longitudinal direction indicated by arrow 14 in the figure while a carriage assembly 3 that supports the ultrasonic cutting tool moves transversely across the anvil 7 to cut the stock material.

In rejecting claim 1, the Examiner refers primarily to the embodiment illustrated in Fig. 9 of Bell, which is reproduced below for the convenience of the Examiner:

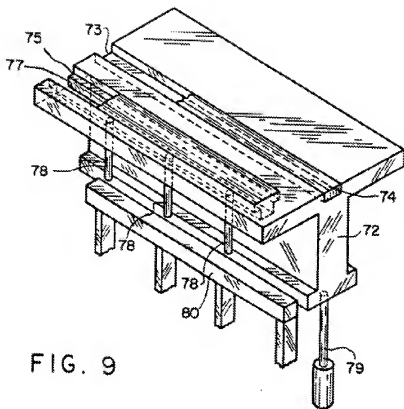


FIG. 9

Bell, Fig. 9.

Bell, in Fig. 9, illustrates an anvil 72 having a LEXAN plastic strip 74 positioned within channel 73 extending along the cutting axis. The Examiner acknowledges, and Applicant agrees, that Bell does not disclose a groove disposed on the surface of an insert that coincides with a cutting path and that is formed in the insert prior to any cutting operation by the ultrasonic blade. The Examiner asserts, however, that Gharst and Jung disclose cutting operations for cutting partially through a material, and that Gharst further discloses utilizing a slitting groove in an anvil underneath a cutting wheel to provide for a cleaner cut without damaging the cutting wheel or the anvil. The Examiner then concludes that it would be obvious in view of Gharst and Jung to use a groove in the anvil of Bell to either effect a partial cut or to protect the ultrasonic cutting blade in Bell. Applicant respectfully disagrees.

Gharst discloses a cutting device for cutting fiber insulation carried on a foil backing (see Abstract of Gharst). The cutting device includes a cutting blade 362 and a scoring blade 318. The cutting blade is adapted to cut through both the insulation and the foil backing, and the device includes a cutting groove 252 below the cutting blade to protect the cutting blade. The scoring

blade 318 is provided to score the insulation so that the insulation can be more easily removed from the foil backing (see Col. 6, lines 41-45 of Gharst).

Initially, it should be noted that blade 362 in Gharst is a cutting blade that cuts through both the insulation and the foil backing. Blade 318, on the other hand, is a scoring blade that scores the insulation, i.e., cuts partially through the insulation so that it can be more easily removed from the foil after the material is cut by the cutting blade. Gharst does not teach or suggest a groove that provides support for the backing of a backed ply material during a cutting operation such that the ply and the backing of the backed ply material “diverge at an interface between the groove and the tip portion of the cutting profile of the ultrasonic blade, and the backing is urged into the groove during the cutting operation, the ultrasonic blade cutting the ply without cutting the backing during the cutting operation” as now recited in claim 1. In Gharst, at best, the scoring operation by the scoring blade may make it easier to subsequently remove the insulation from the backing; however, Gharst does not disclose or in any way suggest that a ply and a backing of a backed ply material diverge at an interface between a groove and a tip portion of the cutting profile of an ultrasonic blade during a cutting operation, or that the backing is urged into the groove during the cutting operation.

Furthermore, claim 1 now recites that the backed ply material includes a ply and a backing in which the backing “is relatively more flexible than the ply”. As a result, during a cutting operation, the stiffer ply responds well to the ultrasonic blade and is cut, whereas the more flexible backing is able to resist the chiseling action of the blade by being allowed the ability to be pushed away from the blade via the groove. None of the cited art recognizes this feature, nor is any of the cited art capable of functioning in this manner. In Gharst, for example, the cutting blade 362 cuts through both the insulation and the backing, while the scoring blade 318 cuts through a portion of the insulation but the grooves therein do not, in any way, enable separation the insulation from the backing.

In this regard, during the above-mentioned interview, the Examiner requested clarification regarding the mechanism that adheres the ply to the backing in the backed ply material, and that allows the backing to separate from the ply. In an advantageous embodiment in which the backing is applied as a prepreg or epoxy primed titanium foil is made, the backing adhesion is due, in part, to the controlled application of heat and pressure to create a controlled bond between the treated backing and the epoxy prepreg or titanium foil epoxy primer which

allows the backing to be removed during the lamination process. Also, another factor that may influence the release force required is the inherent release properties of the backing which may be optimized based on the lamination process and equipment requirements.

It should also be noted that Jung discloses a cutting device having an anvil that has a two-dimensional surface for X-Y, two-axis cutting (plus knife rotation). This is distinguished from the present invention which uses a linear anvil for unidirectional (Y-axis) cutting. Thus, claim 1 recites that the backed-ply material travels in a first direction, that the ultrasonic cutting blade is operable to travel along a cutting path oriented in a transverse manner relative to the first direction, and that the groove is “disposed upon the surface and coinciding with the cutting path.” Applicant respectfully submits that it would not be obvious to utilize a groove such as taught in Gharst in connection with an ultrasonic tool such as shown in Jung, in part, because Jung provides an anvil designed for two-axis cutting and would appear to require multiple grooves that extend in different directions.

Hreha is cited as disclosing a t-shaped insert and does not supply the deficiencies in Bell, Gharst, and Jung as described above.

For at least all the above reasons, neither Bell nor Gharst nor Jung nor Hreha nor their combination teaches or suggests at least “a groove disposed upon the surface and coinciding with the cutting path, the groove being formed in the insert prior to any cutting operation by the ultrasonic blade and having a curved profile corresponding to a tip portion of the cutting profile of the ultrasonic blade, the groove providing support for the backing of the backed ply material during the cutting operation such that the ply and the relatively more flexible backing of the backed ply material diverge at an interface between the groove and the tip portion of the cutting profile of the ultrasonic blade, and the backing is urged into the groove during the cutting operation”, and claim 1 is not obvious in view of, and patentably distinguishes over, the cited art in its present form.

Claims 7 and 8 depend from and further restrict claim 1 and patentably distinguish over the cited art, at least by virtue of their dependency.

Therefore, the rejection of claims 1, 7, and 8 under 35 U.S.C. § 103 has been overcome.

## **II. 35 U.S.C. § 103, Obviousness**

The Examiner has rejected claims 2 and 3 under 35 U.S.C. § 103 as being unpatentable over Bell, Gharst, Jung, Hreha, Miller, U.S. Patent No. 5,028,052 (hereinafter “Miller”), Backlund, U.S. Patent No. 4,060,017 (hereinafter “Backlund”), Pilkington, U.S. Patent No. 4,920,495 (hereinafter “Pilkington”), Gerber et al., U.S. Patent No. 4,373,412 (hereinafter “Gerber”), and Greve et al., U.S. Patent No. 5,072,640 (hereinafter “Greve”). This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

The modified device of Bell discloses the claimed invention except for the material of the anvil. It is first noted that it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. As applicant claims that the anvil could be a metal, high pressure laminate, polymeric material, or a resin, apparently the material of the anvil is not very critical, in as long as the anvil structure is then capable of providing a solid, supporting surface to interact with the ultrasonic cutter. Furthermore, the use of strong, durable materials, such as metals, plastics, and laminates for anvils in combination with cutters, ultrasonic or otherwise, is old and well known in the art as supported by Backlund, Greve, Pilkington, and Gerber. One having ordinary skill in the art at the time of the invention would have been similarly motivated to have designed the Bell anvil to be comprised of a well known structurally supportive material, as the claimed materials were well known for use in the anvil art and the modification would have yielded nothing more than predictable results of a structurally supportive cutting surface.

Office Action dated October 16, 2009, pages 5-6.

Claims 2 and 3 depend from and further restrict claim 1. Miller, Backlund, Pilkington, Gerber and Greve are all cited as disclosing the use of “strong, durable materials” for the anvil recited in claim 1. Neither Miller, Backlund, Pilkington, Gerber nor Greve supplies the deficiencies in Bell, Gharst, Jung and Hreha as discussed in detail above with respect to claim 1. Claims 2 and 3, accordingly, are not obvious in view of, and patentably distinguish over, the cited art, at least by virtue of their dependency.

Therefore, the rejection of claims 2 and 3 under 35 U.S.C. § 103 has been overcome.



### III. 35 U.S.C. § 103, Obviousness

The Examiner has rejected claims 6 and 9 under 35 U.S.C. § 103 as being unpatentable over Bell, Gharst, Jung, Hreha, Miller, and Backlund. This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

The modified device of Bell discloses the claimed invention except that insert (74) comprises a high pressure laminate or nylon. It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the resilient Lexan plastic for another material such as a HPL or nylon, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Office Action dated October 16, 2009, page 6.

Claims 6 and 9 depend from and further restrict claim 1. Backlund is cited as supporting that it would be obvious to form the insert of claim 1 of high pressure laminate or nylon. Miller and Backlund do not supply the deficiencies in Bell, Gharst, Jung and Hreha as discussed in detail above with respect to claim 1. Claims 6 and 9, accordingly, are not obvious in view of, and patentably distinguish over, the cited art in their present form.

Therefore, the rejection of claims 6 and 9 under 35 U.S.C. § 103 has been overcome.

### IV. New Claim 25

Claim 25 has been added to more fully protect Applicant's invention. Claim 25 depends from claim 1, and patentably distinguishes over the cited art in its present form.

V. Conclusion

It is respectfully urged that the subject application is patentable over the cited references and is now in condition for allowance. It is, accordingly, respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

/Gerald H. Glanzman/

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